HOG PASTURES FOR THE SOUTHERN STATES

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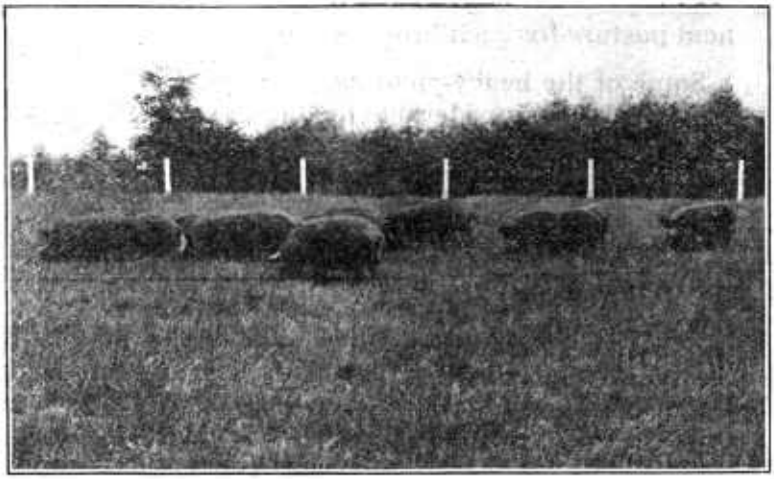

Sows Carried on Permanent Pasture with a Little Grain in Addition

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GREEN FORAGE is essential to the economical production of pork.

A permanent pasture supplemented with quick-growing, heavy-yielding, temporary forage crops is most satisfactory.

There should be on an average 1 acre of permanent pasture for each brood sow kept.

Some of the heavy-yielding, quick-growing forage crops will add considerable feed to the quantity produced by a permanent pasture.

There should be mature crops, such as corn, soy beans, peanuts, or velvet beans, for finishing the hogs in the fall. Oats, rye, and wheat give satisfactory winter grazing.

Green forage alone is little better than a maintenance ration. Where rapid gains are desired, the hogs should have a liberal allowance of grain. The rule should be, all the grain they will eat without waste.

Woven-wire hog fencing tacked to stakes makes the best temporary fence.

Growing forage crops and grazing them off on the land is an efficient method of improving soils depleted in organic matter.

The exercise obtained in grazing exerts a beneficial influence on the health of hogs.

HOG PASTURES FOR THE SOUTHERN STATES.[1]

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FORAGE-CROP PASTURES.

THE FARMER who provides pasture for his hogs whenever possible is the one who makes the production of pork most profitable. The raising of rapid-growing, heavy-yielding forage crops to be fed green to live stock, instead of depending upon the ordinary pasture plants, has been advocated in the United States for more than a hundred and fifty years. Some farmers appreciate the value of forage crops and have worked out the problem of crop production and utilization in a most satisfactory manner.

It is not difficult to outline a succession of crops based on the usual data of seeding, maturing, and average yields which will furnish forage on a given area of land for a certain number of hogs. It has been demonstrated that a greater quantity of forage may be secured on the same area by such a system than will be produced by the ordinary grass or grass and clover permanent pastures. While these systems have been strongly advocated for so many years, rarely is a farmer found practicing such a system.

It must be borne in mind that farmers are operating much of the time under extreme rather than average conditions. Periods of

[1] For matters pertaining to the general care of hogs, the prevention of diseases, the eradication of parasites, etc., the reader is referred to Farmers' Bulletin 874, entitled "Swine Management," by George M. Rommel and F. G. Ashbrook, copies of which, together with the other Farmers' Bulletins mentioned in this publication, may be obtained free from the Division of Publications, United States Department of Agriculture.

drought frequently follow seasons of excessive rainfall, and crop failure from any cause interferes seriously with a complicated succession of forage crops. The great variability of different soils also makes a system based on average yields impracticable. Such yields are misleading, alike for soils which are very rich and for those which are poor in fertility; and, moreover, it is impossible to outline a complete succession of cultivated forage plants covering the entire year without including some very inferior sorts or else using some crops that will give greater value if harvested and sold than if grazed by hogs. The problem for hog raisers to solve is to combine dependable permanent pastures with the heavy-yielding temporary forage crops, in order to avoid periods when no green forage is available. The profits from a season's grazing are often sacrificed in a few weeks when the hogs have to be maintained entirely on high-priced commercial feeds.

VALUE OF GREEN FORAGE FOR HOGS.

The prevailing prices of the various commercial feedstuffs and pork do not justify the raising of hogs on grain or mill feeds alone. From the results of many feeding trials with hogs 10 pounds of gain for each bushel of corn fed, or 1 pound of gain for every 5.6 pounds of corn, is all that should be expected from feeding corn alone in a dry lot. A mixture of one part tankage and nine parts corn gives much better results, usually producing 1 pound of gain for every 4.5 pounds of the mixture fed. It is easy to see that farmers must get more than the customary market prices for hogs or pay less than the usual prices for these feeds in order to stand the risk of loss of animals by disease and to pay the labor and feed bills.

The quantity of grain needed to produce a pound of gain is considerably lessened if the hogs have access to green forage. Corn fed to growing shotes on rape should produce 1 pound of gain for every 3.67 pounds of grain fed. The addition of some highly concentrated feed, such as tankage, meat meal, shorts, or linseed meal, should reduce by one-half to three-fourths of a pound the quantity of grain necessary to produce a pound of gain. These figures are based on the averages of a number of feeding trials at several agricultural experiment stations. They were made with improved breeds of hogs. Equally good results should not be expected from unimproved stock, commonly spoken of as "razorbacks." While the data are somewhat conflicting, apparently as good results as those given above may be obtained while feeding hogs on any nonleguminous green forage crop which the hogs eat as readily as they do rape. The clovers and alfalfa furnish better hog pasture than the nonlegumes.

GRAIN RATION FOR HOGS ON PASTURE.

The cost of pork is reduced materially by the use of pasture and forage crops, but it is desirable to feed some grain in addition. In certain sections of the country where the pastures are luxuriant, mature hogs are maintained in an apparently satisfactory condition on pasture alone. The practice should not be followed in the case of young, growing pigs, because they will become thin and stunted if compelled to live on pasture alone. Hog raisers differ widely regarding the quantity of grain that should be fed to hogs while on pasture. Some feeders give the hogs all the grain they will consume. Others feed a daily ration equal to about 2 or 3 per cent of the live weight of the hog. Still others allow pigs to run on pasture, feeding a 1 per cent grain ration.

Hogs are omnivorous animals, but they are not able to eat sufficient green forage to produce satisfactory gains without some grain. The gains are too slow to be economical. The hog should be considered as a machine for turning feedstuffs into pork. The more quickly this result can be accomplished the more profitable it is for the owner. It is a common belief that if the grain fed to hogs on pasture is limited, more forage will be eaten and cheaper gains produced. This belief is not substantiated by the feeding tests that have been conducted at several agricultural experiment stations. A full feed of grain to hogs on good pasture not only produces the most rapid gains, but usually gives the most profitable results. When account is taken of the saving of labor and the reducing of loss from disease by marketing animals at 7 to 9 months of age instead of keeping them for a year or more, the advantage is almost always with the more rapid growth. The self-feeder system which permits hogs to eat grain at will either in pastures or dry lots is becoming more and more popular in the corn-belt States, and there seems to be no valid reason why self-feeders should not prove equally successful in the South. Some hog raisers build a crib or bin in the pasture field in which they store a quantity of grain, to avoid the daily hauling of grain to the hogs. (Fig. 1.)

A distinction should be made between such forage crops as soy beans, cowpeas, peanuts, and velvet beans, which are hogged off when the seed is mature or nearly mature, and green forage, such as oats, chufas, sweet potatoes, and clover. With the former not so much grain is needed, and what is fed, usually corn, is merely to balance the ration, while with the latter a well-balanced grain ration gives the best results. The self-feeder may be used safely, however, with all crops. Healthy hogs that have as much feed as they will consume give good returns for all they eat.

The foregoing statements apply to growing hogs which are to be marketed for pork. Mature brood sows, where no great increase of weight is desired, are often kept on green forage alone, except those with suckling pigs. Gilts and sows with suckling pigs should receive in addition to the forage a grain ration of such quantity as they will clean up readily when fed two or three times a day.

Under most conditions in the South corn will form the basis of a grain ration. This should be mixed with some protein food. Half corn and half shorts make a desirable grain ration for hogs on pasture, and so do seven to nine parts of corn and one part of tankage, or two parts of corn and one part of cowpea or soy-bean meal.

FIG. 1.—Feeding time on a permanent pasture. Note the crib for storing corn.

These mixtures are merely suggestive, as there are a large number of other good feeds the use of which may be more desirable, depending upon the prevailing prices.

PERMANENT PASTURES.

The importance of having a good permanent pasture for hogs can hardly be overestimated. In many hog-producing localities no other green forage is used than that furnished by grass or grass and clover pastures. The advantage of not having to go to the expense of frequently preparing and seeding the land appeals to most farmers.

The best permanent pastures in the Southern States consist of a mixture of Bermuda grass, lespedeza, bur clover, and white clover. Black medic is useful also in Bermuda-grass pastures, as it reseeds itself the same as bur clover and lespedeza. Alfalfa and sweet clover may be considered as permanent pasture plants in the localities where they grow readily. Carpet grass[1] will thrive better than Bermuda

[1] *Axonopus compressus.*

grass in the sandy soils along the Gulf, and St. Augustine grass,[1] which is very similar to carpet grass in habit of growth, seems best suited to the Atlantic coast south of Charleston, S. C. These permanent pastures may be improved by a little attention in the fall. Disking the sod and seeding to either rye-grass, bur clover, white clover, or narrow-leaf vetch, or some combination of them, will add to the winter grazing of a Bermuda-grass or carpet-grass pasture. The clovers and vetch usually volunteer for several seasons, so this seeding may not have to be repeated every fall. The subject of permanent pastures is considered in a circular issued on December 23, 1914, entitled "Permanent Pastures for the Cotton Belt," a copy of which may be obtained without cost from the Division of Publications, United States Department of Agriculture.

CARRYING CAPACITY OF PASTURES.

Hogs do not relish grasses except when the leaves are young and tender. Hence it is necessary for the best results to keep permanent pastures well stocked. If the plants are allowed to mature, they not only become less palatable but are deficient in feeding value as well. It is usually advisable to have some other stock in the pastures with the hogs to eat the coarser plants. Cattle are best suited for this purpose. Mowing the pasture in late spring should be practiced if the plants become too far advanced.

It is impossible to state how many animals per acre will be supported by a permanent pasture. In most cases it is advisable to have some of the best supplementary forage crops to graze in addition to the pasture. A safe rule is to have a least 1 acre of good permanent pasture for each brood sow kept. Of course, this acreage could be reduced or the number of hogs increased where a complete succession of supplementary forage crops is raised or where the land is very productive. A greater area should be allowed if the grazing is poor.

The carrying capacity of the various supplementary forage crops varies widely, according to the growth of the crop. As a rule it is safe to graze them at the rate of ten to fifteen 100-pound shotes to the acre. A greater number will shorten the grazing period, and fewer animals will lengthen it.

EFFECT OF GRAZING ON THE SOIL.

Growing forage crops and grazing them with hogs are very efficient and economical methods of improving run-down land. This statement is based on the opinions and results of a large number of hog raisers and experiment-station workers. Practically all the fer-

[1] *Stenotaphrum americanum.*

tilizing elements of the vegetation produced on the land, except that stored in animal bodies, goes back into the soil in the manure and litter. The loss is more than offset where extra grain is fed to the hogs. The only danger of injury to the soil is in the trampling by the animals on heavy clays when they are wet. Such injury is easily avoided where a permanent sod pasture is available.

As one of the great needs of most southern soils is more vegetable matter, hog grazing offers an opportunity of restoring the exhausted humus without the expense of growing and using green-manuring crops. Another benefit, which is usually overlooked, comes from the hogs eating the weeds in the pasture fields. There are many common plants, usually classed as weeds, which hogs relish. The common lamb's-quarters and amaranths are especially palatable to hogs. They frequently clean these up first when turned into a new field. This not only makes good use of a number of waste plants, but also tends to lessen the trouble from these weeds in other crops.

TEMPORARY FENCES.

It is often desirable in hog pasturing to fence off portions of fields temporarily. A great many different types of temporary fences have been devised. Most of the board fences of the panel type are too heavy and cumbersome to be practicable. They are also easily broken and soon rot. About the best temporary hog fence is made of 32-inch or 36-inch woven wire. This is easily stretched and tacked to stakes driven in the ground. It may also be used in fencing off parts of a cornfield which are to be hogged off by merely tying the fence to a row of cornstalks. When this is done the tops and ears of the row of corn to which the fencing is tied should be broken off, as then the hogs will not climb up the fence.

Well-fed hogs are easily kept in place, but underfed ones will require more substantial fencing than is here described.

FORAGE CROPS FOR HOGS.

There are a large number of valuable hog forages which may be grown in the South. Every farmer who attempts hog raising on an extensive scale should grow some of these in addition to his permanent pasture. It is possible by the proper selection of crops to have good green forage during all seasons of the year. While the crops considered in this bulletin are not all that might be grown for hog pastures, they are the ones which experience has proved to be the best. Most of these crops may be seeded broadcast, but there is less waste when grazed if they are in rows. The hogs will walk in the space between the rows without trampling down the vegetation, as they do when a crop is broadcasted.

CORN.

The corn crop is so well known and its value for producing a fine quality of meat so well understood that it needs no discussion. The fact that hogs will harvest the corn crop as economically as the farmer will is not so well understood. Hogging off corn has been tested thoroughly at several agricultural experiment stations and by practical hog raisers, and the practice is strongly recommended. Corn alone is not a satisfactory hog ration. Where the crop is to be hogged off, some other crop should be combined with it. Pumpkins seeded at the same time as the corn, soy beans or cowpeas seeded in the same or in alternate rows with the corn, and rye, rape, or soy beans seeded at the last working of the corn have all been used with satisfactory results. The velvet-bean and corn combination is considered under "Velvet beans." With one of these combinations no other grain ration is needed, but if there is no other forage growing in the cornfield, some concentrate, such as tankage, cowpea meal, or middlings, should be fed. It is advisable to start the hogs gradually, for a few days, with a little green corn before turning them into a field of corn to hog it off. The corn is ready for grazing when the grain is dented or glazed. It will take about one month for 14 to 16 hogs, weighing 150 pounds each, to hog off an acre of corn which would yield 35 bushels. It is not advisable to let the hogs have access at any one time to more than they will clean up in 10 days.

SORGHUM.

Sorghum is not a good forage crop for hogs. Young growing shotes will just about maintain their weights while grazing on green sorghum alone, but fat hogs will lose weight unless some grain is fed along with the sorghum. This crop, however, may be used to fill a gap in midsummer, when it is difficult to find anything else that is better. It is better to have sorghum than no green crop for grazing. Farmers with plenty of Bermuda-grass–lespedeza pasture may well depend upon that rather than grow sorghum for hog grazing.

When sorghum is 15 to 24 inches high hogs will eat the entire plant, but later, when the plants are older, they chew the stalks, suck the juice, and spit out the fibrous material. An early variety of cowpeas is often grown with the sorghum. This adds much to the feeding value of the crop.

If used for hog pastures, sorghum may be seeded in rows or drilled broadcast. From 8 to 10 pounds of seed will seed an acre in rows, while 40 pounds is needed for broadcast seedings. One of the best ways of broadcast seeding is to use a grain drill with all the holes running. The crop should be ready for grazing about six weeks after seeding. A good crop of sorghum can be grazed for about two months, if stocked at the rate of 12 to 15 hogs to the acre.

WINTER GRAINS.

Wheat, rye, and oats are often used for hog grazing in the South. They may be seeded after a crop of soy beans, cowpeas, or peanuts has been grazed off. The winter grazing afforded by these crops is about equal to that obtained from a crop like artichokes which has taken an entire season to grow. It matters little which one of these grains is used; in fact, some farmers seed a mixture of any two or all three together where the crop is to be grazed. Green oats are more palatable to hogs than either rye or wheat, and rye appears to be slightly more palatable than wheat, but hogs will readily graze wheat when no other green forage is available. If not grazed too late in the spring, a crop of grain will also be produced. Some prefer to graze during the early spring months and then put the land in corn or some other summer crop. The hogs may be taken from oats when growth starts in the spring and turned back on the field after the oats have headed out and the grain is in the dough stage. About two weeks' additional grazing is usually obtained from this second period.

Grazing ripe wheat or rye, as sometimes practiced, has little to recommend it. Experiments to test the feeding value of unthrashed wheat or rye have seldom shown results favorable to the practice. A crop of wheat is worth more to harvest and sell for grain than it is for hog forage unless the price of wheat is extremely low and that of pork relatively high. The thrashed grain of wheat or rye is a little more valuable, bushel for bushel, than corn for feeding hogs.

Grinding the wheat or rye and feeding it in the form of a slop adds from one-sixth to one-fourth to the feeding value of the grain. It appears from the experimental data on the subject that it would be more profitable to thrash and grind the wheat or rye than to graze the unthrashed crop.

ALFALFA.

Alfalfa is perhaps the best of all green forages for hogs. It starts growth early in the spring. If kept moderately grazed or if mowed at intervals it keeps green all summer. In the South alfalfa will not stand close grazing with hogs. If grazed, sufficient acreage should be allowed so that at least one, and preferably two, cuttings for hay may be made each season. Such light grazing does not seem to injure the stand. Alfalfa is very palatable to hogs and highly nutritious. Unfortunately, it does not do well on all kinds of soils. Its culture, however, is being extended in the South, especially in central Tennessee, northwestern South Carolina, on the limestone soils of western Alabama and eastern Mississippi, on some of the better drained sugar-cane lands of Louisiana, and in the Black-Lands region of Texas.

The high price of alfalfa hay in the South makes it questionable whether it is better to graze this crop with hogs or make it into hay. Some tests which have been conducted, the results of which have never been published, show a greater profit from the hay than from hogs grazed on an equal area. The relative prices of hay and pork should decide this matter.

With corn at 70 cents a bushel and alfalfa pasture at $5 an acre, it cost an average of $3.73 a hundred pounds of gain to produce pork at the North Platte substation in Nebraska. These results covered a large number of feeding tests, including experiments with 1,345 different hogs. The value of the alfalfa eaten per hundred pounds of gain was fixed at 72 cents. As the yearly allowance for alfalfa was placed at $5 an acre and alfalfa hay at $8 a ton in the computations referred to, it is apparent that these valuations should be at least doubled to make them conform to southern conditions. Even with this higher price for alfalfa there should be a good profit from grazing hogs at the present (1918) prevailing prices of pork.

For detailed directions in regard to the culture of this crop, see Farmers' Bulletin 339, entitled "Alfalfa."

BLACK MEDIC AND HOP CLOVER.

Black medic is attracting considerable attention in the Black Prairie section of western Alabama and Mississippi. It is a legume similar in some respects to alfalfa. It is low growing and furnishes excellent grazing in the winter and early spring. Hogs eat it readily. It is an annual crop, but usually reseeds itself. The seed is very similar to that of alfalfa and formerly was often used to adulterate it. Its best use is probably in combination with Bermuda grass and lespedeza in a permanent pasture, as it starts growth much earlier in the spring than those two plants. There are no data to show whether or not it has any advantages over bur clover or white clover. Seed of this plant is seldom on the market in the United States, though it could be obtained easily if the demand justified its being established on a commercial basis. A start may be made by cutting the ripe plants from waste places and scattering them over the pasture fields.

Another weedy legume which seems to have some merit for permanent pastures in the South is low hop clover.[1] Its seed also is not on the market. This plant is liable to be mistaken for lespedeza, but it starts growth early in the spring and has a yellow blossom, while lespedeza makes a slow growth in the spring and has a purple flower. These, together with bur clover and lespedeza, may be considered as permanent pasture plants as well as temporary forages.

[1] *Trifolium procumbens.*

They are valuable to grow with Bermuda grass, and the black medic may be mixed with or used as a substitute for crimson clover as a catch crop for late summer seeding.

RED CLOVER.

In several localities in Tennessee and the limestone regions of the cotton belt red clover grows luxuriantly. Where this crop can be grown successfully little other forage is needed for hogs from spring to fall. If kept grazed to a height of 5 or 6 inches it remains green and in a good growing condition during the hot summer months, but if it is allowed to bloom red clover matures in early June and then languishes until late summer. Grazing should start as soon as the clover is 4 or 5 inches high and should be sufficiently heavy to prevent the plants from blooming. If the clover grows too fast and there is danger of its heading out, one of three things should be done: (1) Turn on more animals, (2) restrict the hogs to a lesser acreage and cut the rest of the clover for hay, or (3) run over the entire field with a mowing machine with the cutter bar carried 4 or 5 inches above the ground. The third plan is perhaps best, in order to insure sufficient grazing for the growing hogs during the hot months of summer.

The common red or June clover is better for hog pasture than the mammoth or sapling variety which is usually grown in the South for hay. Clover will stand grazing at the rate of 10 to 12 hogs to the acre.

Clover may be seeded for hog pastures the same as for hay. It is not advisable to seed in a mixture with grass unless the field is intended for a permanent pasture. Late summer or early fall seeding usually gives better results than spring seeding. Where red clover grows well it may be seeded in corn at the last cultivation or it may be seeded immediately after the corn is harvested. From 10 to 12 pounds of seed to the acre are sufficient.

For further information in regard to the culture of this crop, see Farmers' Bulletin 455, entitled "Red Clover."

CRIMSON CLOVER.

Much attention has been given crimson clover on account of its value as a winter cover crop. Although it is an annual plant, it will live over one winter if seeded in late summer or early fall. It is often seeded in corn or cotton when these crops are laid by. Crimson clover makes considerable winter growth, comes on very early in the spring, and is ready to be grazed off in time to seed cowpeas, soy beans, or peanuts. If allowed to produce its full growth, the season will be a little late for seeding corn or cotton. It will furnish grazing in early spring before Bermuda-grass pasture has made much growth.

Not all soils are suited to crimson clover. It does best on the Coastal Plain sandy loams. It is better adapted to the Middle

Atlantic States than it is to the soils and climate farther south, but it may often be used as a catch crop to good advantage in the latter region. This crop is of very little value when seeded in the spring, and it is doubtful whether it is profitable except when used as here indicated. Hogs relish crimson clover and do very well when pastured on it.

For further information in regard to this crop, see Farmers' Bulletin 550, entitled "Crimson Clover: Growing the Crop."

SOY BEANS.

There is perhaps no better crop for supplementary hog pastures throughout most of the cotton belt than soy beans. The crops which rival it most closely are peanuts and velvet beans. Soy beans have an objectionable effect on the color of the pork and the melting point of the lard, but not to such a marked degree as peanuts or chufas. The best varieties of velvet beans do not mature north of central Georgia and Alabama. Soy beans are not thus restricted. The gains made by hogs on soy beans are almost equal to those made on peanuts. The farmer is reasonably sure of getting a crop, and there are no serious drawbacks connected with their culture. They may be seeded after some winter-grown crop has been grazed off in the spring, thus making an economical use of the land. The soy bean is a soil-improving plant, and many farmers consider the increase in fertility to the soil where the crop is grown and grazed off equivalent to the cost of growing it. Hogs will eat the leaves and stems if turned on soy beans before they are mature. It is usually considered more profitable, however, to allow the beans to ripen before using them.

The reader is referred to Farmers' Bulletin 372, entitled "Soy Beans," for information in regard to the culture of this crop.

VELVET BEANS.

The velvet bean has grown steadily in popularity for the past 20 years as a forage crop for hogs. It is well suited to the light sandy soils of Florida and along the Gulf. By the introduction of sorts maturing earlier than the old Florida velvet bean, the culture of this crop has been extended much farther north than formerly. It is grown primarily for grazing in early winter and is not utilized until the pods are mature, which is usually in November or December. The pods do not shatter or decay easily, and the crop will furnish grazing for two or three months.

The chief value of this crop as a forage for hogs is in the grain, so its culture north of the limits where it matures seed is not to be recommended. Soy beans or cowpeas will give better results than velvet beans for the northern half of the Gulf States. As earlier maturing varieties are produced the region of their usefulness will be extended farther north. At the present time the Georgia velvet

bean, sometimes called "One Hundred Day" and "Speckled," will mature as far north as a line from Charleston, S. C., through Birmingham, Ala.

Some support is needed for the long, trailing vines of velvet beans, as the production of seed is lessened if the vines lie flat on the ground, and there is also more rotting of the pods. Corn is one of

FIG. 2.—A field of cowpeas before it was grazed by hogs.

the best plants to combine with this crop. It may be seeded in rows 6 or 7 feet apart, with a row of velvet beans between the rows of corn. It is advisable to let the corn have a start of two or three weeks before the beans are seeded. The yield of corn will not be large under these conditions, but the whole crop may be hogged off with excellent results. The pork produced by velvet beans is inferior in quality to that made from corn. Such pork should be cured locally into what is commonly spoken of as country-cured hams and bacon.

COWPEAS.

The cowpea crop needs little discussion. It has been grown in the South for a great many years. The ability of cowpeas to make a good growth on land low in fertility is well known. The crop is very useful for green manuring, for hay, and for hog pastures. It is best adapted to the sandy loam soils, where it makes a heavy growth. Hogs relish this crop and will eat the vegetative parts as well as the seed. One of the best ways to use cowpeas as a hog pasture is to combine some early variety with one of the early sweet sorghums for midsummer grazing. The cowpeas will stand late seeding and still produce a crop, and it is often used after oats or some

other winter crop has been harvested. The ripe peas also make good hog feed. These may be harvested, ground, and fed with corn meal as a grain ration to good advantage, provided the harvesting can be done economically. Where hand picking is necessary, it will be more profitable to graze the crop than to harvest it. (Figs. 2 and 3.)

For further information in regard to the culture of this crop, see Farmers' Bulletin 318, entitled "Cowpeas."

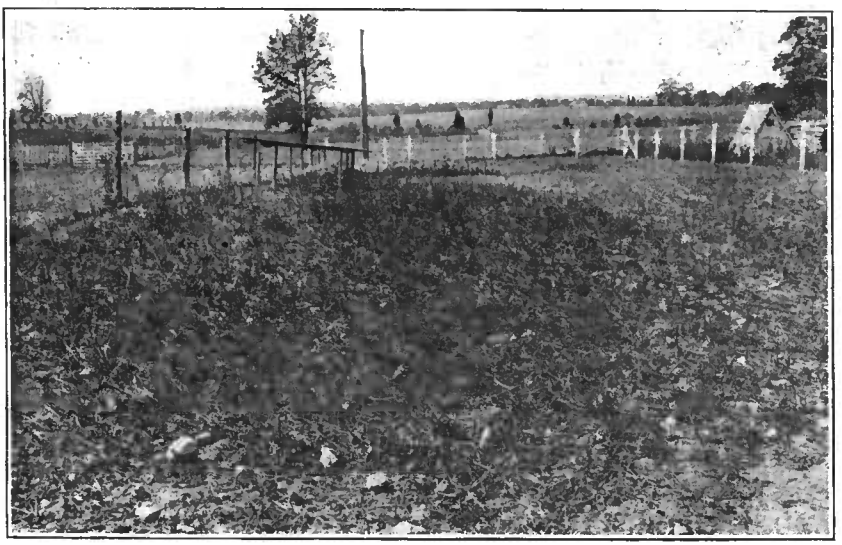

FIG. 3.—The field of cowpeas shown in figure 2 after being grazed by hogs.

PEANUTS.

Most of the southern agricultural experiment stations have experimented with peanuts for pork production. The opinions of the experimenters agree quite closely that it is one of the best forage crops for hogs when gains alone are considered. Pigs fed peanuts alone will make larger gains than when fed corn alone, but a combination of the two feeds will give better results than either alone. The hogs eat the seeds only. The tops may be made into hay for other stock and the hogs can finish the harvesting. The peanuts will keep well in the ground, so the grazing can be extended over quite a long period.

Unfortunately, peanuts do not produce lard and pork of good quality. The melting point of the lard is low, being from 10° to 15° below that of corn-fed hogs. The body lard will often melt at 75° F., or below ordinary room temperature in summer. This makes it very objectionable on the market. The pork is soft and has a dirty, yellowish cast instead of being firm and white like that made from grain. This latter fault is not serious to those who are acquainted with the superior flavor of peanut-fed pork. The hogs which produce

the famous Smithfield hams and bacon of eastern Virginia are finished in the peanut fields. The color does not matter in that case, because of the smoking which is given the meat in curing. Packing-house buyers discriminate heavily against peanut-fed hogs. This accounts in a large measure for the lower prices prevailing in the southern than in northern markets.

Several experiments have been conducted in finishing hogs for market in an attempt to overcome the ill effects of the peanuts. Corn fed for four or five weeks after the hogs have been taken off the peanuts will raise the melting point of the lard, but will not bring it up to the same degree as that of hogs which have not had peanuts. One of the best rations for this purpose tried at the Alabama Agricultural Experiment Station was composed of one part of cottonseed meal and three parts of corn. This ration was a safe feed for three weeks immediately before slaughtering, but no longer, on account of the poisonous effect of the cottonseed meal when fed to hogs. Most of the experimenters agree that grain fed to the hogs while they are running on the peanuts will do more to make firm pork than if fed during a short period after the hogs are taken off the peanuts. This crop will undoubtedly be used a great deal for hog production in the South, many farmers preferring to accept a lower price than to produce the pork without the use of peanuts. There seem to be splendid opportunities in the peanut-growing sections to develop a trade in country-cured hams and bacon similar to the Smithfield products of Virginia. This peanut-fed pork should then command a price higher instead of lower than that from corn-fed hogs.

Peanuts require a loose, open soil for best results, sand or sandy loams being especially suitable. Planting should not be started until the ground is well warmed, and it may extend over a period of two months. This will also extend the grazing period. The peanuts should be planted in 30-inch rows and kept well cultivated.

For further information in regard to the culture of this crop, see Farmers' Bulletin 431, entitled "The Peanut."

CHUFAS.

Many farmers in the South have grown chufas with satisfactory results, as far as gains in pork are concerned. Chufas belong to the sedge family of plants and are similar in appearance and character of growth to the well-known pest nut-grass. The rootstocks of chufas produce large numbers of small, roundish, tuberous growths. These tubers, often spoken of as nuts, are edible and have a sweet, nutty flavor. Hogs are very fond of them and will do their own harvesting. The quality of pork produced on chufas is not first-class, being soft and oily. Experiments have shown that chufa-fed pork and lard are no better than that made from peanuts. The sug-

gestions made under "Peanuts," in regard to the hardening of soft pork, are applicable to hogs fed on chufas.

Chufas grow best on light sandy or sandy loam soils. They will stand considerable dry weather when once established, which makes them valuable for much of the piny-woods lands near the Gulf. A peck of the tubers is sufficient to seed an acre. These should be soaked for several days and then planted in rows, so they may be cultivated. The planting time is from April to June. Sometimes they are planted between corn rows at the last cultivation. Chufas are ready to be grazed in about four months after planting, and they will remain in the ground without decaying over winter or until they are eaten. Some farmers use chufas as the first crop on newly cleared land. The rooting of the hogs in harvesting the tubers helps to destroy the native weeds.

SWEET POTATOES.

The value of sweet potatoes for hog forage is in dispute. The roots alone are scarcely a maintenance ration, but when combined with a liberal grain ration apparently give good returns. The large yields of sweet potatoes on sandy loam soils, together with their good keeping qualities, make this a crop that should receive consideration for hog feeding. It is ready for feeding, however, at the same time that many other desirable hog forages are mature, such as soy beans, velvet beans, or peanuts. The best use, perhaps, that can be made with hogs in handling the sweet-potato crop is to utilize the culls only or the main crop when prices do not justify selling the potatoes on the market. If grown especially for hog forage, one of the large-yielding stock varieties should be used.

Sweet potatoes are propagated chiefly by bedding the small or culled potatoes and transplanting the young shoots; late plantings are sometimes made with vine cuttings. The potatoes should be planted in hotbeds early in the spring. The shoots or slips are not transplanted uutil the ground is thoroughly warm. It takes from 2 to 5 bushels of potatoes to form sufficient slips to plant an acre, depending upon the size of the potatoes. A bushel of small potatoes will give more plants than a bushel of large ones. The plants are usually set in rows 3½ feet apart and spaced about 18 inches apart in the rows.

For further information in regard to the culture of this crop, see Farmers' Bulletin 324, entitled "Sweet Potatoes."

MANGELS.

The Louisiana Agricultural Experiment Station has tested mangels as a forage crop for hogs with satisfactory results. The crop is best harvested and fed to the hogs in pens or while they are on other pastures. Mangels are suited to a fairly cool climate and will not

do well during the hot summer months in the South. If used there they should be seeded in early fall for winter use. This crop also demands a deep, mellow soil with plenty of moisture. It is not advisable to attempt to grow mangels on poor, hard, hilly land. The crop will make a large yield on rich alluvial bottom lands. Mangels should be planted in rows and kept free from weeds. When the plants are 2 or 3 inches high they should be thinned to stand 12 to 18 inches apart in the row. On account of the large amount of hand labor necessary to the successful culture of mangels it is doubtful whether this crop will ever come into general use as hog forage.

RAPE.

Rape as a forage crop for hogs has not been so popular in the South as in the North. It is a well-known plant of the cabbage family and is often grown in the South, under the name of smooth kale, as a garden vegetable for salad. It requires a cool, moist climate for best growth. In hot, dry weather it makes little growth and becomes tough and unpalatable to the hogs. This makes spring seedings, except the very earliest, unsatisfactory. The best use to make of rape for hog pastures in the South is probably for late fall and winter grazing. September seedings give good results, as rape stands light freezing without injury and will furnish grazing throughout the winter. It may be seeded broadcast or in drills. If drilled, it should be cultivated once or twice. It may be mixed with rye or oats in broadcast seedings. Three pounds of seed are sufficient for an acre when seeded in drills or in mixtures with grain, and 5 pounds are enough for broadcast seedings.

An acre of good rape should furnish grazing for three months for 12 to 15 hogs weighing from 75 to 100 pounds each.

SUGGESTED CROPPING SYSTEMS.

As previously stated, it is impossible to plan a succession of crops that will be satisfactory for any large number of farms. Each farmer must plan his own system according to his conditions of climate, fertility, and layout of fields. The following systems are merely suggestive and may be modified in a great many ways as occasion demands. As a rule the most simple cropping system will be the most satisfactory. No one of the systems suggested constitutes what might be termed a "complete succession of crops" except as it is used in conjunction with a permanent pasture. In case of a crop failure some substitute crop should be put in immediately. The success of a hog-pasturing enterprise depends on keeping the land occupied either with a growing crop or one that is being grazed. With the large number of forage crops described in this bulletin to pick from, covering in seeding dates the greater portion of the year,

there is no excuse for idle fields. As a rule it is not practicable to outline a definite rotation of crops with equal acreages. Corn, beans, or other finishing feeds are more essential than some of the other crops, and greater areas of these are needed because the pigs are larger when these are grazed.

On most farms it will be possible to seed some catch crop along with other farming operations, which will greatly help out the hog-pasturing enterprise. Rye and crimson clover may well follow cotton. Bur clover, once established on cotton land, will usually reseed itself. Oats and vetch may follow corn or sweet potatoes. All of these are valuable for hog forage. In most cases it will be more economical to plan a rotation for the whole farm containing several good forage crops, a portion of which may be fenced temporarily and grazed, than to devote a single portion of the farm to hog pastures exclusively. By this means the extra expense of working small areas may be avoided, and it will help to utilize the whole farm and also to save waste.

A FOUR-YEAR ROTATION FOR GENERAL FARMING.

By rotation of crops is meant a definite system of crops on fields of approximately equal areas. All of the crops are grown each year. The terms first year, second year, etc., refer to the order in which crops come on any one particular field. This is shown diagrammatically in the system recommended for fertile uplands (p. 20).

First year.—Cotton, with crimson clover, bur clover, or rye seeded when the cotton is laid by.

Second year.—Soy beans, sorghum, cowpeas, peanuts, or sweet potatoes, followed with some winter cereal seeded in the fall.

Third year.—Wheat, oats, oats and vetch, or rye, followed with cowpeas or soy beans.

Fourth year.—Corn, with a cover crop, such as crimson clover, seeded at the last cultivation.

Fifth year.—Cotton, etc. (Repeat rotation.)

This rotation would provide fall seed for finishing hogs, besides winter and early-spring pasture. A portion of the field devoted to the second-year crops may be seeded to any one or several of the crops suggested, thus providing midsummer pasture. If a farmer possesses a permanent pasture, no other forage would be necessary for the hogs than that supplied by this rotation.

HOG-PASTURING SYSTEM FOR FERTILE BOTTOM LANDS.

The system here suggested consists of a permanent pasture of 10 acres and three fields of 3 acres each. This should furnish sufficient feed to support 10 brood sows and their pigs.

First year.—Corn, in alternate rows with velvet beans, to be used for late fall and winter grazing.

Second year.—Sorghum and early cowpeas, to be grazed in midsummer and early fall and the land seeded to 2 acres of rape and 1 acre of mangels for fall and winter grazing.

Third year.—Soy beans or peanuts, grazed in the early fall and the land seeded to oats or rye and crimson clover for winter and spring grazing.

HOG PASTURING SYSTEM FOR FERTILE UPLANDS.

The system shown in the following diagram consists of 10 acres of permanent pasture and three fields of 3 acres each. It is planned for 10 brood sows and their pigs.

Ten acres, permanent Bermuda-grass-lespedeza pasture.	A.—THREE ACRES: *First year.*—Corn, with soy beans or velvet beans in alternate rows. *Second year.*—Sorghum and early cowpeas, seeded to oats or rye and crimson clover in the fall. *Third year.*—Oats or rye and crimson clover, followed by soy beans or peanuts.
	B.—THREE ACRES: *First year.*—Sorghum and early cowpeas seeded to oats or rye and crimson clover in the fall. *Second year.*—Oats or rye and crimson clover, followed by soy beans or peanuts. *Third year.*—Corn, with soy beans or velvet beans in alternate rows.
	C.—THREE ACRES: *First year.*—Oats or rye and crimson clover, followed by soy beans or peanuts. *Second year.*—Corn, with soy beans or velvet beans in alternate rows. *Third year.*—Sorghum and early cowpeas, seeded to oats or rye and crimson clover in the fall.

HOG-PASTURING SYSTEM FOR POOR CLAY UPLANDS.

The system here suggested is planned for 10 brood sows and their pigs, and should consist of 15 acres of permanent pasture and three fields of 5 acres each.

First year.—Corn and cowpeas, seeded early and followed by rye and crimson clover seeded after the corn is hogged off.

Second year.—Soy beans, to be grazed either at the same time as the corn or later.

Third year.—Sorghum and cowpeas mixed for midsummer grazing and the land to be put in oats for winter use.

HOG-PASTURING SYSTEM FOR LIGHT SANDY SOILS.

The system here suggested consists of 10 acres of permanent pasture and four fields of 3 acres each. It is planned for 10 brood sows and their pigs.

First year.—Corn in alternate rows with soy beans or velvet beans.

Second year.—Chufas or sweet potatoes.

Third year.—Peanuts or cowpeas, followed by rye and crimson clover.

Fourth year.—Winter oats and vetch.

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